In the Claims

Please replace all prior versions, and listings, of claims in the application with the following list of claims:

Please cancel claim 1 without prejudice or disclaimer.

Please add claims 11-37.

1. (Canceled)

2. (Currently amended) A device for controlling a voltage-controlled switch, the device comprising a first circuit for setting to a high level a control terminal of the voltage-controlled switch and a second circuit for setting to a low level the control terminal of the voltage-controlled switch; wherein the first circuit comprises:

a first power transistor capable of connecting the control terminal of the voltage-controlled switch to a high voltage;

a first bipolar control transistor having its emitter connected to the control terminal of the first power transistor, the base of the first control transistor being adapted to receive a control current;

a first diode having a cathode connected to a first predetermined voltage smaller than the high voltage, and having its anode connected to the base of the first control transistor;

[[The control device of claim 1, wherein said at least one of said circuits is the circuit for setting to the high level and comprises]] a first output terminal capable of being connected to the control terminal of the voltage-controlled switch;

the first power and first control transistors being first and second NPN-type bipolar transistors forming a Darlington assembly arranged between the first output terminal and the high voltage;

the anode of the first diode being connected to the base of the first control transistor via a first controllable circuit breaker; and

the first circuit also comprising [[the device]] means for enabling a control block to [[being capable of being connected to a control block]] successively [[enabling]]:

a/ [[applying]] apply the control current to the Darlington assembly and [[turning]] turn

on the first circuit breaker; and

b/ after a first predetermined duration, [[turning]] turn off the first circuit breaker.

3. (Currently amended) The control device of claim 2, wherein the device further comprises first and second P-channel MOS transistors having sources connected to the high voltage, a controllable current source being connected to the drain of the first MOS transistor, the gates of the first and second MOS transistors being connected to the drain of the first MOS transistor and the drain of the second MOS transistor being connected to the base of the first control transistor and to the drain of a third N-channel MOS transistor, having its source connected to a low supply voltage, and means for connecting the gate of the third MOS transistor[[which is capable of being connected]] to [[the]] a control block via a second controllable circuit breaker, a second diode having its cathode and its anode respectively connected to the drain of the third MOS transistor and to the first output terminal.

4. (Currently amended) The control device of claim 3, wherein the first circuit breaker comprises a fourth P-channel MOS transistor having its source connected to the base of the first control transistor and having its drain connected to the anode of the first diode, the gate of the fourth MOS transistor being connected via a third resistor to the drain of a fifth P-channel MOS transistor, the source of the fifth MOS transistor being connected to the high voltage, the gate of the fifth MOS transistor being connected to the gate of the first MOS transistor, the gate of the fourth MOS transistor being also connected:

to the anode of a first zener diode having its cathode connected to the anode of a second zener diode having its cathode connected to the base of the first control transistor;

to the anode of a third diode having its cathode connected to the base of the first control transistor; [[and]]

to the cathode of a fourth diode having its anode connected to the drain of the fifth MOS transistor; and

to the anode of a fifth diode having its anode connected to the drain of the fifth MOS transistor and its cathode connected to the drain of a sixth N-channel MOS transistor having its source connected to a ground voltage and the gate of which is capable of being connected to [[the]] a control block.

5. (Currently amended) The control device of claim 3, wherein the second circuit breaker comprises a buffer circuit having [[an]] a buffer input terminal, [[an]] a buffer output terminal, and a buffer control terminal, and wherein the buffer output terminal [[of which]] can take three states: 1 or 0 according to whether the buffer input terminal is at 1 or 0 when the buffer control terminal is at 1, and a high-impedance state if the buffer control terminal is at 0.

6. (Currently amended) The control device of claim 2, wherein the second circuit [[for setting to the low level]] comprises a second output terminal capable of being connected to the control terminal of the voltage-controlled switch and comprising:

a [[seventh]] second power N -channel MOS transistor arranged between the second output terminal and the low voltage[[,]];

means for connecting [[and]] the gate of the second power MOS transistor [[which is capable of being connected]] to [[the]] a control block via [[the]] a second controllable circuit breaker; [[and]]

a limiting means controllable for, when the second circuit breaker is off, providing the gate of the second power [[seventh]] MOS transistor with an activation voltage as long as the voltage of the second output terminal is greater than a second predetermined voltage ranging between the high and ground voltages; and

means for enabling a control block to, [[the control block enabling,]] upon activation of the Darlington assembly, [[provision]] provide [[of]] a deactivation signal to the gate of the [[seventh]] second power MOS transistor and, a second predetermined duration after the turning-off of the first circuit breaker:

c/ [[deactivating]] deactivate the Darlington assembly and [[turning]] turn off the second circuit breaker; and

d/ after a third predetermined duration, [[turning]] turn on the second circuit breaker and [[providing]] provide an activation signal to the gate of the [[seventh]] second power MOS transistor.

7. (Currently amended) The control device of claim 6, wherein the limiting means comprises a [[third]] second bipolar control transistor arranged between the second output

terminal and the gate of the [[seventh]] second power MOS transistor, and a [[sixth]] second diode capable of canceling the base current of the [[third]] second [[bipolar]] control transistor when the voltage of the second output terminal is smaller than the second predetermined voltage.

8. (Currently amended) The control device of claim 7, wherein the collector of the [[third]] second control [[bipolar]] transistor is connected via a [[fourth]] first resistor to the gate of the [[seventh]] second power MOS transistor, a [[fifth]] second resistor connecting the gate of the [[seventh]] second power MOS transistor to the low voltage, the base of the [[third]] second control [[bipolar]] transistor being connected to the cathode of the [[sixth]] second diode, having its anode connected to the second predetermined voltage, the base of the [[third]] second control [[bipolar]] transistor being also connected via a [[sixth]] third resistor to the drain of [[an eighth]] a control N-type MOS transistor, having its source connected to the ground voltage, and comprising means for connecting [[and]] the gate of the control N-type MOS transistor [[which is capable of being connected]] to the control block.

9. (Currently amended) A device for controlling a voltage-controlled switch, the device comprising a first circuit for setting to a high level a control terminal of the voltage-controlled switch and a second circuit for setting to a low level the control terminal of the voltage-controlled switch, wherein the second circuit comprises:

a power transistor capable of connecting the control terminal of the voltage-controlled switch to a low voltage;

a bipolar control transistor having its collector connected to the control terminal of the power transistor, the base of the control transistor being adapted to receive a control current;

a first diode having an anode connected to a first predetermined voltage smaller than the high voltage, and having its cathode connected to the base of the control transistor;

[[The control device of claim 1, wherein said at least one of said circuits is the circuit for setting to the low level and comprises]] a first output terminal capable of being connected to the control terminal of the voltage-controlled switch;

the power transistor being an N-channel MOS transistor arranged between the first output terminal and the low voltage; [[and]]

the control transistor being a PNP-type bipolar transistor having its emitter and its

collector respectively connected to the drain and to the gate of the power transistor, the gate of the power transistor being further connected to the low voltage via a resistor and connected via a first controllable circuit breaker to a control [[terminal of the power transistor]] block; and

[[the device being capable of being connected to]] the second circuit also comprising means for enabling a control block [[enabling]] to:

a/ [[turning]] turn off the first circuit breaker, and [[applying]] apply the control current of the control transistor; and

b/ after a first predetermined duration, [[deactivating]] deactivate the control current of the control transistor, [[turning]] turn on the first circuit breaker, and [[providing]] provide an activation signal to the gate of the power transistor.

10. (Currently amended) The control device of claim 9, wherein the first circuit [[for setting to the high level]] comprises:

a second output terminal capable of being connected to the control terminal of the voltage-controlled switch;

a Darlington assembly arranged between the second output terminal and the high voltage, a control terminal of the Darlington assembly being likely to receive a control current; [[and]]

a second diode having its cathode connected to a second predetermined voltage smaller than the high voltage and its anode connected to the control terminal of the Darlington assembly via a second controllable circuit breaker; and

means for enabling the control block [[enabling]] to successively:

c/ [[providing]] provide a deactivation signal to the gate of the power transistor, [[applying]] apply the control current of the Darlington assembly, and [[turning]] turn on the second circuit breaker; and

d/ after a second predetermined duration, [[turning]] turn off the second circuit breaker.

11. (New) A device for controlling a voltage-controlled switch, the device comprising a circuit for setting a control terminal of the voltage-controlled switch to a specified voltage, the circuit comprising:

a first power transistor adapted to connect the control terminal of the voltage-controlled switch to the specified voltage;

a first control transistor, wherein the control terminal of the first control transistor is adapted to receive a control current, and wherein another terminal of the first control transistor is connected to the control terminal of the first power transistor; and

a first diode having a terminal adapted to connect to a first predetermined voltage, and having another terminal connected to the control terminal of the first control transistor via a first controllable circuit breaker.

12. (New) The control device of claim 11, wherein the first power transistor comprises a bipolar transistor.

13. (New) The control device of claim 11, wherein the first power transistor comprises a MOS transistor.

14. (New) The control device of claim 11, wherein the first power transistor comprises an insulated gate bipolar transistor.

15. (New) The control device of claim 11, wherein the first control transistor comprises a bipolar transistor.

16. (New) The control device of claim 11, wherein the first control transistor comprises a MOS transistor.

17. (New) The control device of claim 11, wherein the specified voltage is a high voltage.

18. (New) The control device of claim 17, further comprising:

a first MOS transistor and a second MOS transistor having sources adapted to connect to the high voltage, the gates of the first MOS transistor and the second MOS transistor being connected to the drain of the first MOS transistor, the drain of the second MOS transistor being connected to the control terminal of the first control transistor and to the drain of a third MOS

transistor, and the source of the third MOS transistor being adapted to connect to a low supply voltage;

a controllable current source being connected to the drain of the first MOS transistor;

a means for connecting the gate of the third MOS transistor to a control block via a second controllable circuit breaker; and

a second diode having its cathode connected to the drain of the third MOS transistor, the second diode having its anode adapted to connect to the control terminal of the voltage-controlled switch.

19. (New) The control device of claim 18, wherein the first circuit breaker comprises a fourth MOS transistor having its source connected to the control terminal of the first control transistor and having its drain connected to the anode of the first diode, the gate of the fourth MOS transistor being connected via a third resistor to the drain of a fifth MOS transistor, the source of the fifth MOS transistor being adapted to connect to the high voltage, the gate of the fifth MOS transistor being connected to the gate of the first MOS transistor, the gate of the fourth MOS transistor being also connected:

to the anode of a first zener diode having its cathode connected to the anode of a second zener diode, the second zener diode having its cathode connected to the control terminal of the first control transistor;

to the anode of a third diode having its cathode connected to the control terminal of the first control transistor;

to the cathode of a fourth diode having its anode connected to the drain of the fifth MOS transistor; and

to the anode of a fifth diode having its anode connected to the drain of the fifth MOS transistor and its cathode connected to the drain of a sixth MOS transistor having its source adapted to connect to a ground voltage and the gate of which is capable of being connected to a control block.

20. (New) The control device of claim 18, wherein the second circuit breaker comprises a buffer circuit having a buffer input terminal, a buffer output terminal, and a buffer control terminal, and wherein the buffer output terminal can take three states: 1 or 0 according to

whether the buffer input terminal is at 1 or 0 when the buffer control terminal is at 1, and a high-impedance state if the buffer control terminal is at 0.

21. (New) A device for controlling a voltage-controlled switch, the device comprising a circuit, for setting a control terminal of the voltage-controlled switch to a low voltage, wherein the circuit comprises:

a power transistor adapted to connect the control terminal of the voltage-controlled switch to a low voltage;

a control transistor having a control terminal adapted to receive a control current, wherein a first terminal of the control transistor is connected to the control terminal of the power transistor, and also connected, via a controllable circuit breaker, to a control block, and wherein the first terminal of the control transistor is adapted to connect to the low voltage via a resistor; and

a first diode having an anode adapted to connect to a first predetermined voltage, and having its cathode connected to the control terminal of the control transistor.

22. (New) The control device of claim 21, wherein a first terminal of the power transistor is adapted to connect to the control terminal of the voltage-controlled switch, and wherein a second terminal of the power transistor is adapted to connect to the low voltage.

23. (New) The control device of claim 22, wherein a second terminal of the control transistor is adapted to connect to the control terminal of the voltage-controlled switch.

24. (New) The control device of claim 21, the circuit also comprising means for enabling the control block to:

a/ turn off the controllable circuit breaker, and apply the control current of the control transistor; and

b/ after a first predetermined duration, deactivate the control current of the control transistor, turn on the controllable circuit breaker, and provide an activation signal to the control terminal of the power transistor.

25. (New) A method for controlling a voltage on a control terminal of a voltage-controlled power switch using a control circuit, adapted to conduct large currents and provide large voltages to the voltage-controlled switch, the method comprising varying the voltage by stages.

26. (New) The method of claim 25, further comprising increasing the voltage on the control terminal of the voltage-controlled power switch to a first predetermined voltage smaller than a high voltage.

27. (New) The method of claim 26, further comprising maintaining the voltage on the control terminal of the voltage-controlled power switch at the first predetermined voltage for a first predetermined time delay.

28. (New) The method of claim 27, further comprising increasing the voltage on the control terminal of the voltage-controlled power switch to the high voltage after the first predetermined time delay.

29. (New) The method of claim 27, further comprising increasing the voltage on the control terminal of the voltage-controlled power switch to a second predetermined voltage level after the first predetermined time delay, wherein the second predetermined voltage is smaller than the high voltage and larger than the first predetermined voltage.

30. (New) The method of claim 29, further comprising maintaining the voltage on the control terminal of the voltage-controlled power switch at the second predetermined voltage for a second predetermined time delay.

31. (New) The method of claim 30, further comprising increasing the voltage on the control terminal of the voltage-controlled power switch to the high voltage after the second predetermined time delay.

32. (New) The method of claim 25, further comprising decreasing the voltage on the control terminal of the voltage-controlled power switch to a first predetermined voltage larger than a low voltage.

33. (New) The method of claim 32, further comprising maintaining the voltage on the control terminal of the voltage-controlled power switch at the first predetermined voltage for a first predetermined time delay.

34. (New) The method of claim 33, further comprising decreasing the voltage on the control terminal of the voltage-controlled power switch to the low voltage after the first predetermined time delay.

35. (New) The method of claim 33, further comprising decreasing the voltage on the control terminal of the voltage-controlled power switch to a second predetermined voltage level after the first predetermined time delay, wherein the second predetermined voltage is larger than the low voltage and smaller than the first predetermined voltage.

36. (New) The method of claim 35, further comprising maintaining the voltage on the control terminal of the voltage-controlled power switch at the second predetermined voltage for a second predetermined time delay.

37. (New) The method of claim 36, further comprising decreasing the voltage on the control terminal of the voltage-controlled power switch to the low voltage after the second predetermined time delay.